LANSCE Division
Hazard Control Plan Cover Sheet

Handling and transportation of Transuranic Alpha Particle emitting Targets at Lujan FP 14 DANCE Experiment		
LANSCE-3 HCP-21	Revision: 1	Date:September 16, 2003
Location of Work: TA-53/ER-2		Group: LANSCE-3
Authors:	Signature	Date
Ernst Esch		September 16, 2003
Initial Risk Level: medium		
REVIEW/APPROVAL		
Concurrence by:		
Bruce Takala (LANSCE-3)		9-23-03
John Ullman (LANSCE-3)		9/16/2003
Ron Nelson (LANSCE-12)		19 Sept 2003
Scott Walker (HSR-1)		9/19/03
Paul Wiemann (LANSCE-12)		9/19/03
Residual Risk Level: low		
Approved by:	**Signature**	**Date**
Steve Wender (LANSCE-3 GL)		9/24/03
Next Authorization Review Date: 9-24-04		

Work definition:

This Hazard Control Plan (HCP) outlines hazards and safety procedures for handling and transporting alpha emitting targets for the DANCE Detector. The work involves the safe transport, short-term storage, installation and removal of radioactive alpha emitting targets into and out of the DANCE detector. The work can be subdivided in the following steps:

- **Transport**
  1. The target is built at TA-48
  2. It is been swiped for contamination
  3. Packaged into the appropriate container
  4. Shipped to ER-2 at TA-53 by Bus 4
  5. It is received at ER-2, TA-53 and stored in the radioactive material cabinet for the DANCE project
- **Installation and Removal**
  1. Letting the beam pipe up to air.
  2. Removing the lower part of the beam pipe
  3. moving the radioactive target into the experiment crypt
  4. Putting the radioactive target into the beam pipe
  5. Pushing it into place
  6. Closing the beam pipe
  7. Evacuating the beam pipe.
  8. Doing the measurement.
  9. Reversing step 1 to 6 to retrieve the target.

Potential hazards:

Contamination hazard
Material on the target sample comes off and c and settles on surfaces in the experimental area.
While pushing the target into the beam pipe the radioactive material rubs of on the pushing equipment
Due to too a to large pump out speed the radioactive material comes of the target and contaminates the beam pipe and the exhaust air of the vacuum pump.
Trip hazard
Stumbling over obstacles, dropping the target.

Initial Risk:

The initial risk posed by the procedure of "**high**".

Operational requirements:

The following requirements apply to the operations described here and have been used as guidance in developing this HCP.

- ALARA [LIR 402-702-01.1]
- OJT
- CS
- RWP for the job

Controls:

Engineering controls:

To prevent radioactive contamination of the environment the target is designed in such a way that the material is electro-plated onto two Ti-foils which are then glued front-to-front onto each other, thereby preventing source material to emerge (see . Furthermore the target is enclosed in an aluminum target holder, specially designed for radioactive targets (see LA-UR-xx-xxxxxxxxx).

To prevent the radioactive material from coming off the sample foil it is put into a aluminum cylinder container with kapton film beam windows. This will prevent microscopic radioactive target material from entering the beam-pipe or the environment. It will further more act as

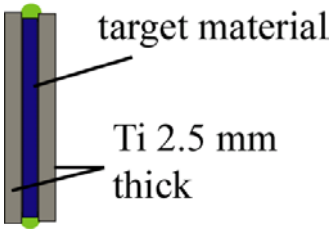

Figure 1: Shematic drawing of the radioactive sample

physical barrier to prevent touching the alpha target and thereby rubbing contamination of.

The holder with the kapton foil has been tested to withstand fast pump down and let of times.

A second backup preventing contamination of the whole beam pipe is the installation of two more kapton windows up and down stream of the DANCE ball.

Administrative controls:

When removing the target from the pipe a plastic foil or tarp will be taped underneath the part of the beam pipe that is removed to prevent a contamination spill onto the experimental area surfaces should the beam pipe be contaminated.

Injury to feet, specifically toes from a falling pipe can be prevented by using steel toed shoes during assembly and disassembly.

Posting:

A copy of this HCP and the RWP will be posted at the entrance to the target building.

Protective clothing requirements:

Closed steel toed shoes
Disposable Gloves
Anti C overalls
Booties

Required Knowledge Skills & Abilities:

Only designated personnel will be allowed to perform the work. The designated personnel must have read and understood the RWP and this HCP, First Aid/CPR training and they must have received OJT.

EMERGENCY PROCEDURES:

The beam window of the radioactive target is broken :
The worker(s) are to evacuate the area immediately and will inform the RCT on duty.

Wastes:

The radioactive targets will be shipped in the container back to TA-48 were they are treated as waste.

Residual Risk:

The residual risk of using the targets with implementation of the above engineering and administrative controls is estimated as "**low**".

Change Control Process:

This document must be reviewed at least annually. The latest version will be available on the LANSCE-3 web site, in the LANSCE-3 group office, and a copy will be in ER-2.

Responsible Individuals:

The handling of the targets is the responsibility of personnel from the DANCE collaboration..
The LANSCE-3 Group Office is located at TA-53, MPF-1, Room C138, telephone number (505) 667-5377.

A list of associated personnel is given below:

Staff member:
Ron Nelson (LANSCE-12) 667????

Staff member:
John Ullmann (LANSCE-3) 667-2517

Technician:
Lloyd Hunt (LANSCE-3), 665-6300

LANSCE-3 Group Leader:
Steve Wender, 667-1344, pager 104-2185, home 983-3634

LANSCE-3 Operations Team Leader:
Bruce Takala, 665-2029, pager 104-8827

Attachment

APPENDIX A

Authorized Target Handlers

Ana Alpizar-Vicente
Todd Bredeweg
Ernst Esch
Uwe Greife
Robert Haight
Robert Hatarik
Lloyd Hunt
Andreas Kronenberg
John O'Donnell
Rene Reifarth
Bob Rundberg
John Ullmann
Dave Vieria
Jan Wouters

By signing below Sample Handlers certify that they have read and understood this HCP and meet the training and clearance requirements specified:

_____

Ana Alpizar-Vicente Date

_____

Todd Bredeweg Date

_____

Ernst Esch Date

_____

Uwe Greife Date

_____

Robert Haight Date

_____

Robert Hatarik Date

_____

Lloyd Hunt Date

Andreas Kronenberg	Date
John O'Donnell	Date
Rene Reifarth	Date
Bob Rundberg	Date
John Ullmann	Date
Dave Vieria	Date
Jan Wouters	Date